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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/053,003	01/17/2002	Joseph E. Geusic	1303.042US1	1238
21186	7590	09/23/2004	EXAMINER	
SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A. P.O. BOX 2938 MINNEAPOLIS, MN 55402			KUNEMUND, ROBERT M	
			ART UNIT	PAPER NUMBER
			1765	

DATE MAILED: 09/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/053,003	Applicant(s) GEUSIC ET AL. 9	
	Examiner Robert M Kunemund	Art Unit 1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 June 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-51 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-51 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>6/18/04</u> . | 6) <input type="checkbox"/> Other: _____ |

The Rejections

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 to 23, 25 to 29, 31 to 34, 37, 38, 40 to 43 and 45 to 51 are rejected under 35

U.S.C. 103(a) as being unpatentable over John et al (Journal of Lightwave Tech).

The John et al reference teaches a method of making and a 3-D photonic crystal. On a substrate, two layers of the 3-D photonic crystal are placed. Spherical voids are created in both layers. The voids are of similar sizes in both layers. The structure has a diamond unit cell. The voids in the layers are formed so that the combination of the two layers of the voids creates the 3-D photonic crystal, note figure 1 and pages 1934 and 1935. The sole difference between the instant claims and the prior art is the formation

along the imaginary bonds. However, in the absence of unexpected results, it would have been obvious to one of ordinary skill in the art to determine through routine experimentations the optimum, operable means to orientate the 3-D photonic crystal in the John et al reference in order to create the desired optical properties as the reference does teach different orientation create different 3-D photonic crystal.

Claims 24, 30, 35, 36, 39 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over John et al.

The John et al reference is relied on for the same reasons as stated, supra, and differs from the instant claims in the means to create the voids and determining the voids. However, in the absence of unexpected results, it would have been obvious to one of ordinary skill in the art to determine through routine experimentations the optimum, operable means to create voids and determine the second voids in the John et al reference in order to produce a uniform voids creating uniform bandgaps.

Response to Applicants' Arguments

Applicant's arguments filed June 15, 2004 have been fully considered but they are not persuasive.

Applicants' argument concerning the rejection of the independent claims in view of John is noted. However, the John et al reference does teach a 3-D photonic crystal structure. The structure has two layers. The voids in the first layer as seen in the figures are distinct from each other. Note, from the support for distinct in the specification comes from the drawings, applicants position, the voids merely are not touching. All voids in the John et al reference therefore are distinct. Also, the entire

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structure makes a 3-D photonic crystal, thus, one layer does not complete the bandgap. Applicants' argument concerning the imaginary bonds is noted. However, applicants have not shown how the reference does not have imaginary bonds or in view of the teachings of the reference the bonds do not exist since the bonds are merely imaginary to begin with.

Applicants' argument concerning claims 24, 30, 35, 36, 39 and 44 has been considered and not deemed persuasive. It is the examiner's position that the means of formation is well within the skill of the art. Also, that different means to form voids can be used to create the structure. The modification to the John et al reference is thus obvious and well within the skill of the art.

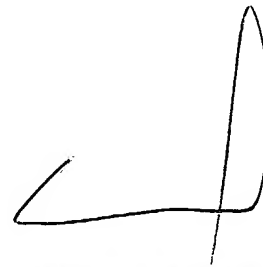
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert M Kunemund whose telephone number is 571-272-1464. The examiner can normally be reached on 8 hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RMK

A handwritten signature in black ink, consisting of a stylized 'R' followed by a vertical line and a small loop at the top.

**ROBERT KUNEMUND
PRIMARY EXAMINER**